# TITLE

# VIDEO DISPLAY APPARATUS HAVING HOTKEY FUNCTIONS AND A METHOD THEREFOR

## CLAIM OF PRIORITY

This application makes reference to, incorporates the same herein, and claims all benefits accruing under 35 U.S.C. §119 from my application *VIDEO DISPLAY APPARATUS HAVING A HOTKEY FUNCTION AND METHOD USING THE SAME* filed with the Korean Industrial Property Office on 15 June 1999 and there duly assigned Serial No. 22400/1999.

## BACKGROUND OF THE INVENTION

### Field of the Invention

The present invention relates to a video display apparatus having a hotkey function and a method of operating the apparatus. More particularly, the invention concerns a video display apparatus having a hotkey function for menu-selection and manipulation of user-selected, frequently utilized video apparatus control functions. The invention also concerns a method of operating a video display apparatus by use of a hotkey button.

### Description of the Prior Art

Video display apparatuses, such as a television receiver and, a monitor, have various functions to permit users to adjust them. Such TV functions include color adjustment (*e.g.*, tint), a

1    volume control for an audio signal, and audio signal mute. Monitors have functions such as screen

2    size adjustment, screen position adjustment, screen contrast/brightness adjustments, and audio signal

3    mute.

4        Most video display apparatuses have one or more buttons for users to control them. The

5    buttons are used to output signals for executing these functions immediately or else to output signals

6    for displaying on-screen display (OSD) menu screens. Each menu screen has one or more menu

7    items such as "make screen larger or smaller", "move screen up or down", and "make sound louder

8    or quieter".

9        As the number of video functions has multiplied, embodying the functions has created a need

10    for additional buttons to implement the additional functions. Accordingly, using a function control

11    method in a video display apparatus embodied in an OSD menu method has become relatively more

12    advantageous than the previous button method. However, the resulting multiplication and greater

13    complexity of menus and sub-menus may confuse users or irritate them. As functions multiply, the

14    time period for selecting an OSD menu item is lengthened since the user must repeatedly press arrow

15    buttons to select an OSD menu item. Multimedia developments create even greater complexities

16    for users.

17        In a known TV menu system illustrated in Figs. 1A-1B, when a user presses an OSD button

18    equipped on a front panel of a video display apparatus an OSD menu screen 2 appears with a cursor

19    placed on a predetermined menu item. For the user to select a menu item on the OSD menu screen,

20    the user moves the cursor by using arrow buttons on the video display or by using an input device

21    (remote control device). Thus, for the user to select "AUDIO MUTE" function in Fig. 1A, the user

1 moves the cursor three times downwards from its initial position by using an arrow button. Then,

2 an OSD menu screen 4 as shown in Fig. 1B is displayed, while audio sound is sent out through a

3 speaker.

## SUMMARY OF THE INVENTION

5 Accordingly, it is an object of the present invention to provide a video display apparatus

6 having a hotkey function. The video display apparatus has hotkey buttons, capable of controlling

7 the video display apparatus by a function set by a user. The user selects as a hotkey button an item

8 frequently selected by that user from the menu items for controlling the functions of the video

9 display apparatus.

10 The video display apparatus of the present invention comprises: a button unit including

11 hotkey buttons for providing key signals corresponding to menu items of an OSD menu that the user

12 selects; a memory unit having information on OSD menu items set for the hotkey buttons; an OSD

13 unit for providing an OSD character display signal to a video processing unit in response to a control

14 signal sent from an external device and for displaying OSD characters on the screen; and a control

15 unit for reading information for an OSD menu item stored in the memory unit when a button is

16 selected by the user.

17 The hotkey button setting method for a video display apparatus of the invention comprises

18 the steps of (1) determining if a menu item from an OSD menu is selected by a user; (2) generating

19 an OSD menu screen in case that the menu item is selected; (3) determining if the user set a hotkey

20 button information on a menu item on the OSD menu screen; and (4) changing hotkey button

1    information stored in a memory unit when a hotkey button is set on a menu item, and storing such

2    hotkey button information in the memory unit if the user sets the hotkey button information on a

3    given menu item.

4    **BRIEF DESCRIPTION OF THE DRAWINGS**

5    A more complete appreciation of the invention, and may of the attendant advantages, thereof,

6    will be readily apparent as the same becomes better understood by reference to the following detailed

7    description when considered in conjunction with the accompanying drawings in which like reference

8    symbols indicate the same or similar components.

9    Figs. 1A-1B depict a screen view showing a known OSD menu item selection and process.

10    Fig. 1A is the screen as it first appears. Fig. 1B is the screen after AUDIO MUTE function is

11    selected.

12    Fig. 2 schematically shows a structure of a video display apparatus having hotkey functions

13    according to an embodiment of the present invention.

14    Fig. 3 is a flow chart for a method for re-setting hotkey button information in a memory

15    according to the embodiment of the present invention.

16    Fig. 4 is a flow chart for a processing method when a hotkey button is selected according to

17    an embodiment of the present invention.

18    Figs. 5A-5B depict a screen view showing an embodiment of the present invention. Fig. 5A

19    is the screen as it first appears. Fig. 5B is the screen after AUDIO MUTE function is selected.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

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2       A preferred embodiment of the present invention will be described in detail with reference

3  to the accompanying drawings.

4       Referring to Fig. 2, which is a schematic showing a video display apparatus having hotkey

5  functions according to an embodiment of the present invention, it is seen that a button unit 10 has

6  buttons and is mounted on the body of a video display apparatus such as a television receiver.

7  Button unit 10 may include several hotkey buttons each of which has information on one OSD menu

8  item of OSD menu items selectable by a user.

9       A memory unit 20 stores information corresponding to each of the selectable OSD menu

10  items and information on each of hotkey buttons. Memory unit 20 also stores information on hotkey

11  buttons which is changeable by means of a control unit 30.

12       Control unit 30 sends an OSD character display signal to an OSD unit 340 when an OSD

13  menu item is selected through the button unit 10. Further, control unit 30 can change hotkey button

14  information stored in memory 20 and will then store the changed hotkey button information on a

15  user-selected OSD menu item, which is selected by using button unit 10. Further, control unit 30

16  can control the entire system by reading hotkey button information stored in memory unit 20 when

17  a hotkey button is selected through button unit 10. At this time, if there does not already exist any

18  stored information on the selected hotkey button, control unit 30 controls the entire system by

19  reading information from an OSD menu item set as a default.

20       Turning now to an embodiment of the present invention for use with a monitor, control unit

21  30 is adapted to input a color signal and a synchronization signal from a video card built into a

1   computer and controls a video processing unit 50. In another embodiment of the invention for use

2   with a television receiver, control unit 30 is adapted to input a broadcast signal received through an

3   antenna to control video processing unit 50.

4   An OSD unit 40 outputs an OSD character signal according to an OSD character display

5   signal from the control unit 30. Video processing unit 50 synthesizes a video signal and the OSD

6   character signal from the OSD unit 40, according to a control signal from control unit 30, which

7   causes display of characters on a screen.

8   A method for storing hotkey button information and selecting a hotkey button in a video

9   display apparatus according to an embodiment of the present invention is now described with

10   reference to the accompanying drawings.

11   Control unit 30 has two principal modes. One is a "setting mode" for setting a frequently

12   used OSD menu, and the other is a "processing mode" for controlling the entire system based on

13   user-selected hotkey button information.

14   First, the setting mode is described with reference to Fig. 3. If a user presses a button (not

15   shown) for an item of an OSD menu for a video display apparatus, control unit 30 receives a signal

16   from the pressed button and sends an OSD character display signal to OSD unit 40. This causes

17   display of an OSD menu on a screen. OSD unit 40 receives the OSD character display signal and

18   sends an OSD character signal to video processing unit 50. The video processing unit adds the OSD

19   character signal to a video signal to display an OSD menu on the screen (step S320). Control unit

20   30 then determines whether a user has selected a menu item from the OSD menu displayed on the

21   screen. If a menu item was selected, control unit 30 determines whether hotkey button was selected.

1    If a hotkey button was selected, the control unit changes hotkey button information stored in

2    memory unit 20 to newly selected information on the OSD menu and stores the changed information

3    (S350).

4    If no hotkey button was selected, control unit 30 reads from memory unit 20 and executes

5    the information corresponding to the OSD menu item (S370) to control an entire function of the

6    video display apparatus.

7    If in step S330, the selected OSD menu item from an OSD menu on the screen was found

8    not to be included, control unit 30 checks if a cancel signal was inputted by a user. If a non-signal

9    predetermined input time period lapses, the system determines whether a cancellation was made

10    (S360). If so, control unit 30 stops execution of th process.

11    The processing mode of control unit 30 for a hotkey button is now described with reference

12    to Fig. 4. First, the control unit determines whether a hotkey button was selected by a user (S410).

13    If so, detection circuitry (*e.g.*, computer program instructions executed in a microprocessor) in the

14    · control unit determines whether information on the hotkey button is set in memory unit 20 (S420).

15    If it is determined that information on the hotkey button exists, the detection circuitry

16    ("detector") of control unit 30 reads the information on the hotkey button from memory unit 20

17    (S430). The control unit then executes its operation to control the entire system according to a signal

18    corresponding to the information (S450). If it is determined that, in step S420, information on a re-

19    set hotkey button does not exist in memory unit 20, the detector of control unit 30 reads hotkey

20    button information which is set as a factory default (S440) and executes its operation to control the

21    entire system (S450).

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1     If it is determined in step S420 that the hotkey button information re-set in memory unit 20

2     does not exist, the detector of control unit 30 of the video display apparatus reads the hotkey button

3     information which is set as a factory default from the memory unit (S440), and executes its

4     operation for the entire system in response to the hotkey button information (S450).

5     Fig. 5 is a screen view illustrating on embodiment of the present invention. As shown in Fig.

6     5, if a user selects a button for outputting an OSD menu screen using button unit 10, control unit 30

7     controls OSD unit 40 to display an OSD menu 6 on the screen as shown in Fig. 5A. If a hotkey

8     button is then selected by a user, control unit 30 changes hotkey button information set in memory

9     unit 20 to "AUDIO MUTE" information and stores the changed hotkey button information. Then,

10     if a user selects the hotkey button, as shown in Fig. 5B, an "AUDIO MUTE" message on screen

11     menu 8 is outputted and the sound outputted through the is muted.

12     Further, when OSD menu items are increased due to increasingly diverse functions of the

13     video display apparatus, plural subscreens may be furnished. A desired OSD menu screen out of the

14     plural subscreens may be controlled to be stored in memory unit 20 as hotkey button information.

15     Accordingly, if a user wishes to control frequently used functions, from OSD menu screens

16     or menu items, the user sets hotkey button information to display a desired OSD menu screen

17     immediately without other OSD menu screens. Thus, the video display apparatus of the invention

18     permits the user to control the functions of the video display apparatus with more ease and

19     convenience.

20     Although the preferred embodiments of the present invention has been described, it will be

21     understood by those skilled in the art that the present invention should not be limited to the described

1    preferred embodiment. Rather, various changes and modifications can be made within the spirit and

2    scope of the present invention as defined by the following claims.